

REMARKS

Claims 22-47 are pending in the application with claims 22, 27, 38, and 41-43 amended herein. The amendments directed to purge exit ports are supported at least by paragraphs 35 and 36 of the previously submitted substitute specification and corresponding text in the originally filed specification. Deletion of the word "partially" from the phrases "partially extending" and "to partially extend" in respective claims 22 and 38 merely removes an extraneous word as supported at least by Figs. 1-3 of the present specification and the text associated therewith. Deletion of the phrase "flow into the chamber and" in claim 41 also merely removes an extraneous phrase.

Claims 22-35 and 40-47 stand rejected under 35 U.S.C. 102(e) as being anticipated by Ohashi. Applicant requests reconsideration.

Amended claim 22 sets forth a CVD method that includes, among other features, injecting purge material through a purge exit port into a deposition chamber, providing a solid barrier wall inside the chamber to separate the injected purge material from a substrate holder, and forming a purge curtain from the injected purge material. The solid barrier wall extends into the chamber from at least one of the chamber walls. The purge curtain extends downward from elevationally above the substrate holder, flowing past and bypassing the substrate holder. Pages 2-3 of the Office Action allege that Ohashi discloses each and every limitation of claim 22. Applicant traverses.

Page 2 of the Office Action alleges that the "straightening vane" of Figs. 8 and 10 in Ohashi read on a flow diverter. Applicant assumes that the Office intended also to allege that such Ohashi structure reads on the "solid barrier wall" of claim 22 even

though such position is not expressly stated. Some uncertainty exists regarding what specific Ohashi structure the Office refers to by the term “straightening vane.” The Ohashi text corresponding to Figs. 1-3 refers to straightening vane 17 shown in detail in Figs. 2 and 3. However, the text corresponding to Figs. 8 and 10 refers instead to an apparently analogous “link portion” 828, 1158, and 1268 shown in detail in Figs. 9, 11, and 12, respectively. Contrary to the Office’s allegation, the link portion 828, 1158, and 1268 as well as straightening vane 17 do not “extend into the chamber from the top (first wall, lid) of the chamber” shown in Figs. 1, 8, and 10.”

Despite such uncertainty, Applicant nevertheless asserts that no structure in Figs. 8 or 10 or elsewhere throughout Ohashi discloses injecting purge material through a purge exit port into a deposition chamber and providing a solid barrier wall inside the chamber to separate the injected purge material from a substrate holder. In Ohashi, straightening gas is not injected through a purge exit port into a deposition chamber (i.e., a chamber where deposition occurs) until the straightening gas passes through flow-out holes such as 828a, 1158a, or 1268a.

Straightening gas supply ports “I” do not disclose purge exit ports since the straightening gas merely enters space portion 829 or 1049 shown in Figs. 8 and 10 of Ohashi. It is clear from the express disclosure of Ohashi that such reference does not consider space portion 829 or 1049 to constitute a deposition chamber and it does not appear that any deposition occurs in such space portions. Claim 22 clearly sets forth that the solid barrier wall is inside the chamber and that it separates the injected purge material from a substrate holder. As also clearly set forth in claim 22, the injected purge material is the material injected through a purge exit port into a deposition chamber. Review of Ohashi does not reveal any solid barrier wall that separates

straightening gas from rotator 822 or 1042 after the straightening gas passes through flow-out holes 828a, 1158a, or 1268a.

Stated another way, the flow-out holes, straightening vane, link portions, and space portions of Ohashi merely describe alternative configurations for a shower head arrangement of multiple inlets or other apparatuses for distributing process gases. Any walls or other structures within such shower head arrangements would not be considered by those of ordinary skill to be within a deposition chamber. Paragraph 30 of the present specification discusses such showerhead arrangements and paragraph 38 discusses an exemplary deposition chamber 36 that is a part of a deposition chamber apparatus 2 shown in Figs. 1-3.

The express text of claim 22 is clearly directed toward separating purge material from a substrate holder with a solid barrier wall after the purge material is injected into a deposition chamber through a purge exit port. Such an approach may be contrasted with the straightening gas distribution apparatuses of Ohashi that merely manipulate gas flows prior to straightening gas entering a deposition chamber. Ohashi fails to disclose the claimed solid barrier wall inside a deposition chamber separating injected purge material that entered the chamber from a purge exit port. At least for the reasons indicated above, Applicant asserts that Ohashi fails to anticipate claim 22. Claims 23-26 depend from claim 22 and are not anticipated at least for such reason as well as for the additional limitations of such claims not disclosed or suggested.

Amended claim 27 sets forth a deposition method that includes, among other features, injecting a deposition precursor into a deposition chamber and, while injecting the precursor, separately injecting a purge material through a purge exit port into the chamber. The method includes separating the injected purge material from a substrate

holder with a flow director provided inside the chamber and minimizing backflow of the purge material towards the substrate holder. As may be appreciated from the discussion above regarding the deficiencies of Ohashi as applied to claim 22, Ohashi also fails to disclose every limitation of claim 22. Accordingly, Ohashi does not anticipate claim 27. Claims 28-35 and 40 depend from claim 28 and are not anticipated at least for such reason as well as for the additional limitations of such claims not disclosed.

Amended claim 41 sets forth a CVD method that includes, among other features, injecting purge material through a purge exit port into a deposition chamber, forming a purge curtain from the injected purge material, providing a flow director inside the chamber to cause the purge curtain to bypass the substrate holder, and minimizing backflow of the injected purge material towards the substrate holder using the flow director. As may be appreciated from the discussion above regarding the deficiencies of Ohashi as applied to claim 22, Ohashi fails to anticipate claim 41. Claim 42 depends from claim 41 and is not anticipated at least for such reason as well as for the additional limitations of such claim not disclosed.

Amended claim 43 sets forth a CVD method that includes, among other features, injecting a purge material through a purge exit port into a deposition chamber, injecting a precursor into the deposition chamber, forming a purge curtain from the injected purge material, and flowing the injected purge material such that the purge curtain is formed between a chamber wall and the injected precursor to prevent the injected precursor from migrating towards the chamber wall. The method includes preventing the purge material from flowing towards a substrate holder with a flow director provided inside the chamber to separate the purge curtain and the injected precursor and to

minimize backflow of the injected purge material towards the substrate holder. As may be appreciated from the discussion above regarding the deficiencies of Ohashi as applied to claim 22, Ohashi fails to anticipate claim 43. Claims 44-47 depend from claim 43 and are not anticipated at least for such reason as well as for the additional limitations of such claims not disclosed.

In keeping with the discussion above, Applicant asserts that claims 22-35 and 40-47 are not anticipated by Ohashi. Applicant requests allowance of such claims in the next Office Action.

Claims 36-39 stand rejected under 35 U.S.C. 103(a) as being unpatentable over DiMeo in view of Ohashi. Applicant requests reconsideration.

Claim 38 sets forth a deposition method that includes, among other features, injecting a deposition precursor into a deposition chamber, ceasing delivery of the precursor and delivering purge material through a process chemical port. The method includes, while delivering the purge material through the process chemical port, separately delivering a purge material through a purge port, and separating the purge port purge material from a substrate holder with a flow director provided inside the chamber. The purge delivery through the purge port occurs along chamber walls and through a dead space as to the process chemical port purge material. As may be appreciated from the discussion above regarding the deficiencies of Ohashi as applied to claim 22, Ohashi fails to disclose or suggest separating the purge port purge material from a substrate holder with a flow director provide inside the deposition chamber, as set forth in claim 38. DiMeo does not remedy and is not alleged to remedy such deficiency of Ohashi. At least for such reason, the cited combination of references fails to disclose or suggest every limitation of claim 38.

In addition, Applicant asserts that no motivation exists to combine DiMeo and Ohashi. Page 3 of the Office Action alleges a motivation to modify DiMeo by using the straightening gas of Ohashi to prevent particles from adhering to walls of the chamber, as taught by Ohashi. However, thorough review of Ohashi and comparison to the DiMeo digital CVD process reveals that the particles generated in the Ohashi process do not occur in the DiMeo process. Accordingly, no motivation exists to modify DiMeo by including the Ohashi straightening gas.

Fig. 3 of DiMeo reveals that providing precursor reactant source 44 is always separated from providing oxidant reactant source 48 by inert purge gas 46. That is, as taught by DiMeo, at no time are precursor reactant source 44 and oxidant reactant source 48 intentionally provided within reactor chamber 10 at the same time. Such a circumstance may be contrasted with the processing shown in Fig. 14 of Ohashi that generates particles. As those of ordinary skill clearly understand from the discussion in column 2, line 44 to column 3, line 8 of Ohashi, the gas phase reaction and formation of particles only occurs in circumstances where reactants are provided together. If only one type of reactant is provided, then such reactant does not react with itself in the gas phase to form particles. Accordingly, those of ordinary skill would consider DiMeo to eliminate the particle generation problem of Ohashi by providing precursor reactant source 44 separate from oxidant reactant source 48, as is conventional during digital CVD. Thus, those of ordinary skill would not find any motivation to modify DiMeo with the straightening gas of Ohashi since it would apparently not provide any benefit in the DiMeo method.

As disclosed in paragraphs 26 and 27, only the Applicant's own specification identifies an advantage to providing targeted purging in ALD where precursors are

provided separately. The targeted purging may remove residual precursors that remain in chamber dead spaces after conventional purging between precursor flows. Neither cited reference comprehends such an advantage. Thus, Applicant asserts that the Office's conclusion of obviousness is based on improper hindsight reasoning. Applicant acknowledges that judgments on obviousness may necessarily involve a reconstruction based in a sense on hindsight reasoning. However, such reconstruction can only take into account knowledge that was within the level of ordinary skill in the art at the time the claimed invention was made and cannot include knowledge gleaned only from Applicant's disclosure. In re McLaughlin, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971); MPEP 2145(X)(A).

Applicant asserts that some motivation in the art must exist to support a combination of references, that the motivation alleged by the Office does not exist, and that the Office Action does not identify any valid suggestion in the prior art of the desirability of the proposed DiMeo modification. At least for such additional reasons, Applicant asserts that the cited combination cannot be considered to disclose or suggest every limitation of claim 38. Claim 39 depends from claim 38 and is patentable at least for such reason as well as for the additional limitations of such claim not disclosed or suggested.

Claims 36 and 37 depend from claim 27, the subject matter of which is discussed above. By virtue of their dependence from claim 27, claims 36 and 37 are patentable over Ohashi at least for the failure of such reference to disclose every limitation of claim 27. DiMeo fails to remedy the deficiencies of Ohashi. Further, claim 36 sets forth that injecting the purge material occurs at a first flow rate while injecting the precursor and that the method further includes ceasing the precursor injection and

substituting the precursor injection for additional purge material injection. As may be appreciated from the discussion above regarding the deficiencies of DiMeo in view of Ohashi as applied to claim 38, such references fail to disclose or suggest every limitation of claim 36.

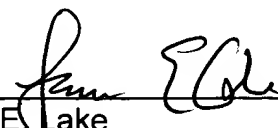
In keeping with the discussion above, Applicant asserts that claims 36-39 are patentable over DiMeo in view Ohashi and request allowance of such claims in the next Office Action.

Applicant sets forth adequate reasons supporting patentability of claims 22-47 and requests allowance of all such pending claims in the next Office Action.

Further, Applicant previously submitted a Supplemental Information Disclosure Statement and Form PTO-1449 of which it does not yet have an initialed copy from the Examiner. This Supplemental Information Disclosure Statement was initially submitted to the U.S. Patent and Trademark Office on May 26, 2004. To the extent the PTO-1449 has not already been initialed in the file, such examination and initialing is requested at this time along with returning of a copy to the undersigned.

Respectfully submitted,

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